

REMARKS

In view of the above amendment, Applicants believe the pending application is in condition for allowance.

Claims 1, 3-6, 8-17 and 19-26 are now present in this application. Claims 1, 6, 12, 17 and 22 are independent.

Amendments have been made to claims 1, 6, 12, 17, 19 and 20. Claims 2, 7 and 18 have been canceled. Reconsideration of this application, as amended, is respectfully requested.

Priority Under 35 U.S.C. § 119

Applicants thank the Examiner for acknowledging Applicants' claim for foreign priority under 35 U.S.C. § 119, and receipt of the certified priority document.

Information Disclosure Citation

Applicants thank the Examiner for considering the references supplied with the Information Disclosure Statements filed March 11, 2004, June 1, 2004, December 28, 2005 and May 11, 2006, and for providing Applicants with initialed copies of the PTO-1449 or PTO-SB08 forms filed therewith.

Drawings

Applicants thank the Examiner for indicating that the drawings are accepted.

Rejection Under 35 U.S.C. § 112, 2nd Paragraph

Claims 1-11 and 17-21 stand rejected under 35 U.S.C. § 112, 2nd Paragraph. This rejection is respectfully traversed.

The Examiner has set forth certain instances wherein the claim language of claims 1, 6 and 17 is not clearly understood.

In order to overcome this rejection, Applicants have amended claims 1, 6, and 17 to correct each of the deficiencies specifically pointed out by the Examiner. Applicants respectfully submit that the claims, as amended, particularly point out and distinctly claim the subject matter

which Applicants regard as the invention. Accordingly, reconsideration and withdrawal of this rejection are respectfully requested.

Rejections under 35 U.S.C. §103

Claims 1-4, 6-10 and 17-20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Nelson. This rejection is respectfully traversed.

A complete discussion of the Examiner's rejection is set forth in the Office Action, and is not being repeated here.

While not conceding the appropriateness of the Examiner's rejection, but merely to advance prosecution of the instant application, Applicants respectfully submit that independent claim 1 has been amended to recite a combination of steps in a method for detecting a position for a mobile robot including receiving an infrared signal and ultrasonic signals; receiving an infrared signal and ultrasonic signal; calculating a time difference between the received infrared signal and the ultrasonic signals; and detecting a position of a mobile robot on the basis of the calculated time difference and a distance value previously stored between ultrasonic wave generators generating the ultrasonic signals, wherein in the step of calculating the time difference, respective times at which the ultrasonic signals have been received are measured on the basis of the time at which the infrared signal has been received.

In addition, Applicants respectfully submit that independent claim 6 has been amended to recite a combination of steps in a method for detecting a position of a mobile robot including transmitting an infrared signal generated from a fixed infrared generator and ultrasonic signals generated from fixed ultrasonic wave generators, to a mobile robot; calculating a time difference between the transmitted infrared signal and the ultrasonic signals; calculating each distance between the mobile robot and the ultrasonic wave generators on the basis of the calculated time difference value; and detecting a position of the mobile robot on the basis of the calculated distance value and a distance value previously set between the ultrasonic wave generators, wherein in the step of calculating the time difference, the time at which the ultrasonic signals have been received is measured on the basis of the time at which the infrared signal has been received.

Finally, Applicants respectfully submit that independent claim 17 has been amended to recite a combination of elements in an apparatus for detecting a position of a mobile robot including wherein an infrared signal and ultrasonic signals are received, a time difference between the received infrared signal and the ultrasonic signals, and a position of a mobile robot is detected on the basis of the calculated time difference value and a distance value between ultrasonic wave generators generating the ultrasonic signals, wherein the apparatus comprises means for measuring a time at which the ultrasonic signals have been received on the basis of the time at which the infrared signal has been received.

Applicants respectfully submit that these combinations of steps and elements as set forth in independent claims 1, 6 and 17 are not disclosed or made obvious by the prior art of record, including Nelson.

The Examiner states that the rejection of the claims are based on an interpretation of the claims as being "directed to an ultrasonic signal," as contrasted with multiple ultrasonic signals. (Office Action, Page 2) In addition, the Examiner states that Nelson discloses only "a single ultrasonic wave sent," as contrasted with multiple ultrasonic signals sent. (Office Action, Page 6)

In contrast to the disclosure of Nelson, the present invention is directed to methods and an apparatus which utilize more than one ultrasonic signal, i.e."ultrasonic signals" for detecting a position of a mobile robot. Independent claims 1, 6 and 17 have been amended to clearly recite "ultrasonic signals." In addition, independent claims 1, 6 and 17 have been amended to recite that the time that the ultrasonic signals have been received is measured "on the basis of the time at which the infrared signal has been received."

Applicants agree with the Examiner that Nelson is directed only to a method and device which utilises a single ultrasonic wave, as contrasted with the plural ultrasonic signals utilized and claimed in the present invention. As such, Applicants respectfully submit that Nelson does not disclose or make obvious a combination of steps or elements where the time that the ultrasonic signals have been received is measured on the basis of the time at which the infrared signal has been received, as is utilized and claimed in the present invention.

Applicants respectfully submit that the combinations of elements and steps as set forth in independent claims 1, 6 and 17 are not disclosed or made obvious by the prior art of record,

including Nelson, for the reasons explained above. Accordingly, reconsideration and withdrawal of this rejection are respectfully requested.

With regard to dependent claims 2-4, 7-10 and 18-20, Applicants submit that claims 2, 7 and 18 have been canceled, and that claims 3, 4, 8-10, 19 and 20 depend, either directly or indirectly, from independent claims 1, 6 and 17 which are allowable for the reasons set forth above, and therefore claims 3, 4, 8-10, 19 and 20 are allowable based on their dependence from claims 1, 6 and 17. Reconsideration and allowance thereof are respectfully requested.

Allowable Subject Matter

Applicants thank the Examiner for indicating that claims 12-16 and 22-26 are allowed. A minor amendment has been made to claim 12 to correct a typographical error, which should not change the allowability thereof.

Applicants also thank the Examiner for indicating that claims 5, 11 and 21 would be allowable if rewritten in independent form. However, claims 5, 11 and 21 have not been rewritten in independent form at this time, since it is believed that independent claims 1, 6 and 17, from which claims 5, 11 and 21 depend, are allowable.

Additional Cited Reference

Since the remaining reference cited by the Examiner have not been utilized to reject the claims, but have merely been cited to show the state of the art, no comment need be made with respect thereto.

Conclusion

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance.

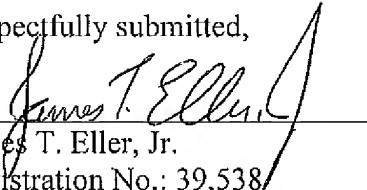
If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone James T. Eller, Jr., Registration No. 39,538, at (703) 205-8000, in the Washington, D.C. area.

Prompt and favorable consideration of this Amendment is respectfully requested.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

By 
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